

# NOTES ON NEARCTIC ORTHOPTEROUS INSECTS. I. NON-SALTATORIAL FORMS.

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In the course of preparing a new catalogue of the Orthoptera of the United States and Canada various points of systematic interest have arisen which seem best to publish prior to the issuing of the catalogue. In studying the material in the United States National Museum it was found convenient to construct keys to certain genera and species. Some of these keys, together with a few to higher groups, seem worth publishing as aids for the easy identification of native species. The present paper treats of matter of this character pertaining to the nonsaltatorial forms.

## Family FORFICULIDÆ.

Recent classifications accord ordinal honors to this group, and it is well deserving of it. The same may be said of other families of the Orthoptera but in the catalogue now in course of preparation the old classification, placing the Forficulidæ as a family, is retained.

The Forficulidæ of the world have been divided into six families by the latest classification, that of Burr, *Genera Insectorum*, fasc. 122 (1911). This comprehensive work treats the earwigs as suborder Forficulina, the Hemimeridæ as suborder Hemimerina, and the interesting insect recently described by Jordan as *Arixenia esau* as suborder Arixenina, all three suborders constituting the order Dermaptera. The earwigs are here divided into six groups of family rank grouped into three superfamilies. Of these, six families of earwigs, which in the proposed catalogue of United States Orthoptera are designated as subfamilies, we have representatives of four. They may be separated as follows.

### *Key to subfamilies of nearctic Forficulidæ.<sup>1</sup>*

a<sup>1</sup>. Second tarsal segment prolonged beneath the third (fig. 1).

b<sup>1</sup>. Second tarsal segment expanded, cordate.....FORFICULINÆ.

b<sup>2</sup>. Second tarsal segment in no ways expanded.....CHELISOCHINÆ.

<sup>1</sup> In studying earwigs it is well to remember that the second segment of the antennæ is always very short, often scarcely noticeable, while the basal segment is large and long, usually broader than any of the others. Also it is useful to remember that the abdomen shows six ventral segments in the female and eight in the male as this is often of assistance in determining the sex when the structure of the forceps are not sufficiently distinctive, or these organs are missing.

*a*<sup>2</sup>. Second tarsal segment not prolonged beneath the third.

*b*<sup>1</sup>. Sixth segment of the antennæ usually clavate and always fully twice as long as the greatest width, usually distinctly more than twice as long, and, together with the fourth and fifth segments, generally longer than the basal segment (fig. 2) ..... LABIINÆ.

*b*<sup>2</sup>. Sixth segment of the antennæ fusiform and almost never twice as long as the greatest width and, together with the fourth and fifth segments, rarely longer than the basal segment. .... LABIDURINÆ.

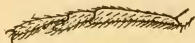


FIG. 1.—TARSUS OF FORFICULA SHOWING THE SECOND SEGMENT PROLONGED BENEATH THE THIRD.



FIG. 2.—BASAL PORTION OF ANTENNA OF LABIA, SHOWING RELATIVE STRUCTURE OF THE SEGMENTS.

Of the subfamily Forficulinæ we have represented two genera, *Forficula* and *Doru*. These two genera and the species and varieties represented by each may be separated as follows.

*Key to genera and species of the subfamily Forficulinæ.*

*a*<sup>1</sup>. Fourth segment of antenna less than twice as long as broad; forceps of the male conspicuously depressed anteriorly across the base, and much broadened.

*Forficula* Linnæus.

*b*<sup>1</sup>. Forceps of the male no longer than the abdomen beyond the tips of the elytra and strongly bowed.....*F. auricularia* Linnæus.

*b*<sup>2</sup>. Forceps of the male longer than the abdomen beyond the tips of the elytra and less strongly bowed.....*F. auricularia* var. *forcipata* Stephens.

*a*<sup>2</sup>. Fourth segment of antennæ twice as long as broad; forceps of the male less depressed basally, and then only on the inner margin, and less broadened.....*Doru* Burr.

*b*<sup>1</sup>. Wings projecting beyond the tips of the elytra.

*c*<sup>1</sup>. Forceps of the male with an inner tooth in the apical third.

*d*<sup>1</sup>. Larger and stouter, extreme length of male, including the forceps, more than 14 mm. and the greatest width of the abdomen usually more than 2.5 mm.....*D. linearis* Escholtz.

*d*<sup>2</sup>. Smaller and more slender, extreme length of male, including the forceps, no more than 14 mm. and the greatest width of the abdomen usually no more than 2.5 mm.....*D. linearis* var. *exilis* Scudder.

*c*<sup>2</sup>. Forceps of the male without an inner tooth in the apical third.

*d*<sup>1</sup>. Larger and stouter, extreme length of male, including the forceps, more than 14 mm. and the greatest width of the abdomen usually more than 2.5 mm.....*D. linearis* var. *californica* Dohrn.

*d*<sup>2</sup>. Smaller and more slender, extreme length of male, including the forceps, no more than 14 mm. and the greatest width of the abdomen usually no more than 2.5 mm.....*D. linearis* var. *exilis* Scudder.

*b*<sup>2</sup>. Wings not projecting beyond the tips of the elytra.....*D. luteipennis* Serville.

The cosmopolitan species *Forficula auricularia* has long been recorded as occurring in nearctic America, but there seems to be very few specimens in collections. There are seven specimens, one male and six females, in the Scudder collection labeled as from New York, from the Uhler collection. It doubtlessly occurs in our fauna sufficiently prevalent to warrant it a place in the catalogue, but the

variety *forcipata* has been reported but once from within our borders and then as an accidental importation.

The members of the genus *Doru* (= *Apterygida* and *Sphingolabis* authors not Westwood and Bormans) are represented by two species, *linearis* and *luteipennis*. *D. exilis* of Scudder I have reduced to varietal rank and *luteipennis* of Serville may eventually prove to be but a form of that species, but the absence of the wing scale makes so easy its separation that I have chosen to include it as specifically distinct. *D. californica* Dohrn scarcely deserves listing as of varietal distinctness as the presence or absence of inner teeth of the forceps of the male seems to mean very little. The same variation also occurs in the smaller and more slender *exilis*, but no name has ever been assigned to it. *D. exilis* is but a small form of *linearis* and shows no structures of specific importance.

Of the subfamily Chelisochinæ we have but one genus, *Chelisoches* of Scudder, which contains a single species recorded from our country, the *C. morio* of Fabricius, a large black earwig found in California.

The subfamily Labiinæ is represented in nearctic America by four genera, which may be separated as follows.

*Key to the genera of the subfamily Labiinæ.*

- a*<sup>1</sup>. Cheeks, as viewed from above, as long as, or longer than, the eyes (fig. 3).  
*b*<sup>1</sup>. Fourth antennal segment cylindrical and as long as the third segment (fig. 2); size small, rarely over 7 mm. in length including the forceps. . . . . *Labia* Leach.  
*b*<sup>2</sup>. Fourth antennal segment more or less conical and distinctly shorter than the third segment (fig. 4); size larger, rarely, if ever, less than 8 mm. in length including the forceps.  
*c*<sup>1</sup>. Smaller, entire length, including forceps, rarely over 10 mm.; eyes smaller, scarcely as long as the basal segment of the antennæ. . . . . *Prolabia* Burr.  
*c*<sup>2</sup>. Larger, entire length, including forceps, rarely less than 11 mm.; eyes larger, about as long as the basal segment of the antenna . . . . . *Spongovostox* Burr.  
*a*<sup>2</sup>. Cheeks, as viewed from above, shorter than the eyes (fig. 5). . . . . *Vostox* Burr.



FIG. 3.—HEAD OF LABIA FROM ABOVE, SHOWING LENGTH OF CHEEKS BEHIND THE EYES.



FIG. 4.—BASAL PORTION OF ANTENNA OF PROLABIA, SHOWING RELATIVE STRUCTURE OF THE SEGMENTS.



FIG. 5.—HEAD OF VOSTOX FROM ABOVE, SHOWING THE LENGTH OF THE CHEEKS BEHIND THE EYES.

These genera are closely related, *Prolabia* and *Spongovostox* indeed being scarcely separable from species found in our fauna except by the uniformly larger size of the latter. *Labia* is very distinct from all the others by the long cylindrical shape of the fourth segment of the antennæ and also by the minute size. *Vostox* agrees with *Pro-*

*labia* and *Spongovostox* in the character of the shorter subconical fourth segment of the antennæ but the shorter cheeks and longer eyes will serve to distinguish it.

*Labia*, as represented in our fauna, contains two species, *L. minor* Linnæus, and *L. curvicauda* Motschulsky. This last is a cosmopolitan species just recently recorded from within our boundaries, a number having been taken in Florida by Mr. Hebard, of Philadelphia. Like *L. minor*, also a cosmopolitan species but occurring widely distributed in the United States, *curvicauda* is a minute species but is easily distinguished from its ally by the decidedly more curved forceps of the male and by the last ventral segment of the abdomen being unarmed in both sexes while in the male of *minor* it bears a backward projecting tooth. The females of these two species are harder to separate but the unicolorously yellow brown legs of *minor* are quite distinct from those of *curvicauda*, which are darker basally or more or less infuscated all over.

*Prolabia* contains two distinct species found in the United States. They may be separated by the following key.

*Key to species of genus Prolabia.*

- a*<sup>1</sup>. Wings not projecting beyond the tips of the elytra.
- b*<sup>1</sup>. Segments of the apical half of the antennæ strongly clavate, the sides nearly straight; last ventral segment of male three times as broad as long, the pygidium of the same sex tapering posteriorly.....*arachidis* Yersin.
- b*<sup>2</sup>. Segments of the apical half of the antennæ fusciform; last ventral segment of the abdomen of the male no more than twice as broad as long, the pygidium of same sex quadrate.....*unidentata* var. *burgessi* Scudder.
- a*<sup>2</sup>. Wings projecting beyond the tips of the elytra.....*unidentata* Beauvois.

*Prolabia arachidis* Yersin is a cosmopolitan species recorded a number of times from just south of the United States but never yet reported north of Mexico except once under the name *Labia burgessi* by Samuel Henshaw.<sup>1</sup> Besides specimens from the lot on which this record of Henshaw was based, the United States National Museum contains one male taken from a ship at San Francisco, California, which had recently arrived from India, and also a pair from a lot of specimens taken by Prof. A. P. Morse in a slaughterhouse in Brighton, Massachusetts, on February 1, 1909. Recently a single female of this species was sent to the United States National Museum by G. N. Collins, who collected it at Aiken, Florida, in May, 1908.

The *Labia brunnea* of Scudder is here sunk in synonymy under *arachidis* Yersin. Types of *brunnea* have been examined and found to differ in no essential character from specimens of *arachidis* from Mexico named by Burr or the above-mentioned male from California, also named by Burr as *arachidis*. *Brunnea* is evidently unknown to

<sup>1</sup> Psyche, vol. 9, 1900, p. 119.

Burr, as he lists it in the genus *Labia* in his fascicule of *Genera Insectorum*. It belongs, however, to *Prolabia* and is a synonym of *arachidis*, as stated above.

*Prolabia unidentata* Beauvois includes as synonyms the *Labia guttata* and *melancholica* of Scudder and the *Forficula pulchella* of Serville. *Prolabia burgessi* Scudder, first relegated to varietal rank under *unidentata* by Burr, is superficially like *arachidis* but is structurally quite different, as indicated in the foregoing key.

The genus *Spongovostox* is represented in our fauna by the single species *apicidentata* Caudell, described as a *Spongiphora*.

*Vostox* Burr is represented in nearctic America by the type-species, the *Spongiphora brunneipennis* of Serville.

The fourth subfamily as represented in our fauna contains three genera, *Psalis* Serville, *Labidura* Leach, and *Anisolabis* Fieber. The characters given in the following key will serve to separate them.

*Key to genera of subfamily Labidurinae.*

- a<sup>1</sup>. Metasternum at posterior margin almost or quite, often more than, twice as broad as the width of one of the hind coxæ (fig. 6).
- b<sup>1</sup>. With both elytra and wings; cheeks behind the eyes, as viewed from above, no longer than the eyes; sixth joint of antennæ generally no longer than broad.....*Labidura* Leach.
- b<sup>2</sup>. With neither elytra nor wings; cheeks behind the eyes, as viewed from above, a little longer than the eyes; sixth joint of antennæ generally a little longer than broad.....*Anisolabis* Fieber.
- a<sup>2</sup>. Metasternum at posterior margin but little, if any, broader than the width of one of the hind coxæ (fig. 7).....*Psalis* Serville.

Of the above genera, *Labidura* and *Psalis* are each represented in our fauna by a single species. The other genus, *Anisolabis*, contains two species found within our boundaries, both cosmopolitan, one, *A. maritima* Gén , being found only along the seashore. The second species of *Anisolabis*, *A. annulipes* Lucas, is often found quite a distance from the coast. It has one or two of the segments in the apical portion of the antennæ whitish and almost always has the femora banded with blackish. These characters will serve to distinguish it from *maritima*, which has the femora and antennæ unicolorous.

*Psalis percheroni* Guerin and Percheron is the only representative of the genus *Psalis* from the United States. It was recorded from a single specimen taken many years ago in Massachusetts by Harris. This specimen, now lost, was an accidental introduction, and so the species is not really eligible for entrance in our lists except as a casual visitor.

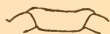


FIG. 6.—META-  
STERNUM OF  
LABIDURA,  
SHOWING THE  
POSTERIOR  
WIDTH AS COM-  
PARED WITH  
THAT OF THE  
HIND COXA.



FIG. 7.—META-  
STERNUM OF  
PSALIS, SHOW-  
ING THE POS-  
TERIOR WIDTH  
AS COMPARED  
WITH THAT OF  
THE HIND  
COXA.

## Family BLATTIDÆ.

As regards subfamily division the Blattidæ is indeed the most difficult family of Orthoptera with which the systematist has to deal. Many of the characters used for the separation of the roaches into the dozen or more subfamilies into which they are usually divided are secondary sexual in nature, are not consistently correlative, or are otherwise unsatisfactory. Eleven subfamilies are usually recognized by students of the Blattidæ, but Kirby recognizes 16 in his Synonymic Catalogue of Orthoptera. Scudder considered the nearctic forms as catalogued by him as comprising seven families. I have united *Periplanetinæ* with *Blattinæ*, their distinguishing feature being a secondary sexual character. The late Mr. Shelford, of England, an authority on this group, inaugurated this change some months ago.

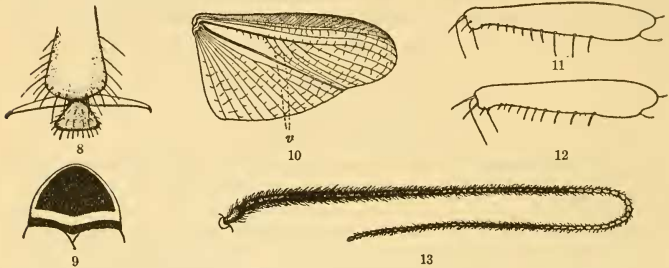


FIG. 8.—CLAWS OF EURYCOTIS, SHOWING THE AROLIA BETWEEN THEM.

FIG. 9.—PRONOTAL DISK OF PHYLLODROMICA, SHOWING COLORATION.

FIG. 10.—WING OF ISCHNOPTERA, SHOWING VENATION. *v*—INCOMPLETE BRANCHES OF THE ULNAR VEIN.

FIG. 11.—FORE FEMORA OF BLATTELLA, SHOWING VENTRAL ARMATURE.

FIG. 12.—FORE FEMORA OF SUPELLA, SHOWING VENTRAL ARMATURE.

FIG. 13.—ANTENNÆ OF PSEUDOMOPS, SHOWING BASAL SWELLING.

The seven subfamilies into which I consider the nearctic Blattidæ as falling may be separated by the following key.

*Key to subfamilies of nearctic Blattidæ.*

- a*<sup>1</sup>. Middle and hind femora armed beneath along one or both margins with two or more distinct spines.
  - b*<sup>1</sup>. Pronotum and elytra densely covered with microscopic silky pile. NYCTOBORINÆ.
  - b*<sup>2</sup>. Pronotum and elytra smooth, or but sparsely haired or pilose. . . . . BLATTINÆ.
- a*<sup>2</sup>. Middle or hind femora, or both, unarmed beneath, or armed with hairs or bristles only, or with one or two apical or subapical spines on one or both margins.
  - b*<sup>1</sup>. Claws separated by a distinct arolium (fig. 8).
    - c*<sup>1</sup>. Wings provided with a distinct apical field. . . . . PLECTOPTERINÆ.
    - c*<sup>2</sup>. Apterous, or the wings without or with an indistinct apical field.
      - PANCHLORINÆ.
  - b*<sup>2</sup>. No arolium between the claws, or only a minute one.
    - c*<sup>1</sup>. Anal field of the wing with a single fold, or apterous with the pronotum more or less pilose or hairy. . . . . CORYDINÆ.

c<sup>2</sup>. Anal field of the wing with two or more folds, or apterous with the pronotum smooth.

d<sup>1</sup>. Supraanal plate of both sexes apically notched.....BLABERINÆ.

d<sup>2</sup>. Supraanal plate of both sexes apically entire.....PANESTHINÆ.

The subfamily Nyctoborinæ is represented with us by two genera, the first, *Attaphila* Wheeler, comprising only the minute myrmecophilous species *fungicola* Wheeler from Texas, and the second, *Nyctobora* Burmeister, a genus of very large roaches, of which three species have been recorded from within our boundaries, all three being introductions.

Of the subfamily Blattinæ we have several genera, which may be distinguished by the following superficial key.<sup>1</sup>

*Key to genera of subfamily Blattinæ.*

a<sup>1</sup>. Larger, the pronotum 7 mm. or more in length.

b<sup>1</sup>. Elytra extending nearly or entirely to the tip of the abdomen.

c<sup>1</sup>. Elytra extending considerably beyond the tip of the abdomen.

*Periplaneta* Burmeister.

c<sup>2</sup>. Elytra not or barely exceeding the tip of the abdomen.. *Pelmatosilpha* Dohrn.

b<sup>1</sup>. Elytra falling considerably short of the tip of the abdomen.

c<sup>1</sup>. Pronotum uniformly black.

d<sup>1</sup>. Arolia small, less than one-half as long as the claws.....*Blatta* Linnaeus.

d<sup>2</sup>. Arolia large, fully one-half as long as the claws.....*Eurycotis* Stål.

c<sup>2</sup>. Pronotum with yellowish markings.....*Blatta* Linnaeus.

a<sup>2</sup>. Smaller, the pronotum less than 7 mm. in length.

b<sup>1</sup>. Antennæ setaceous, sparsely pilose.

c<sup>1</sup>. Elytra of the male extending beyond the tip of the abdomen; subgenital plate of the female entire.

d<sup>1</sup>. Small, entire length no more than 8 mm.

e<sup>1</sup>. Elytra of female falling much short of the tip of the abdomen.

*Ischnoptera* Burmeister.

e<sup>2</sup>. Elytra of both sexes extending nearly or quite to the tip of the abdomen.

*Ceratinoptera* Brunner.

d<sup>2</sup>. Larger, entire length more than 8 mm.

e<sup>1</sup>. Disk of pronotum shiny black with a bright yellow stripe bounding it, this stripe being marginal laterally and separated from the edge narrowly in front and broadly behind (fig. 9).....*Phyllodromica* Fieber.

e<sup>2</sup>. Disk of pronotum not as above.

f<sup>1</sup>. Posterior ulnar vein of wing with some of the branches incomplete or ending in the dividing vein (fig. 10).

g<sup>1</sup>. Cerci extending distinctly more than one-half its own length beyond the tip of the supra-anal plate.....*Ischnoptera* Burmeister.

g<sup>2</sup>. Cerci not extending distinctly more than half its own length beyond the tip of the supra-anal plate.....*Phaetalia* Stål.

f<sup>2</sup>. Posterior ulnar vein of wing simple, or with all the branches extending to the apex of the wing, or the vein connected to the dividing vein by parallel cross veins.

g<sup>1</sup>. Anterior inferior margin of the fore femora armed on the basal half with from three to five or six strong spines succeeded distally by a row of smaller close-set spinules (fig. 11); elytra of nearctic forms unicolorous.....*Blattella* Caudell.

<sup>1</sup> *Epilampra* does not appear in this table. It is known in our fauna by a single unnamed specimen, a female from New Jersey, in the collection of the Academy of Natural Sciences in Philadelphia.

- g*<sup>2</sup>. Anterior inferior margin of fore femora armed along its entire length with stout spines which diminish in length toward the apex (fig. 12); elytra distinctly marked with black.....*Supella* Shelford.
- c*<sup>2</sup>. Elytra of male falling distinctly short of the tip of the abdomen; subgenital plate of the female fissate.....*Blatta* Linnæus.
- b*<sup>2</sup>. Antennæ basally incrassate and densely pilose (fig. 13)....*Pseudomops* Serville.

The three species of *Periplaneta* represented in our fauna are separable by the characters given in the following tables, one table based on the males and one on the females.

*Key to male species of genus Periplaneta.*

- a*<sup>1</sup>. Supraanal plate produced considerably beyond the subgenital plate, apically rounded and deeply notched.....*americana* Linnæus.
- a*<sup>2</sup>. Supraanal plate not or scarcely produced beyond the subgenital plate, apically truncate and not deeply notched.
- b*<sup>1</sup>. Elytra marked by a yellow humeral sripe, in distinct contrast to the color of the rest of the elytra.....*australasiæ* Fabricius.
- b*<sup>2</sup>. Elytra without a distinct yellow humeral sripe.....*brunnea* Burmeister.

*Key to female species of genus Periplaneta.*

- a*<sup>1</sup>. Elytra marked by a yellow humeral sripe, in distinct contrast to the color of the rest of the elytra.....*australasiæ* Fabricius.
- a*<sup>2</sup>. Elytra without a distinct yellow humeral sripe.
- b*<sup>1</sup>. Cerci with all the segments except the last one or two quadrate or transverse, the whole cercus tapering from near the middle (fig. 14); pronotum usually uniformly shiny blackish brown, rarely with paler mottling.....*brunnea* Burmeister.
- b*<sup>2</sup>. Cerci with several of the apical segments longer than broad, the whole cercus tapering from about the base; pronotum always with paler mottlings (fig. 15).....*americana* Linnæus.



FIG. 14.—CERCI OF PERIPLANETA BRUNNEA, FEMALE.

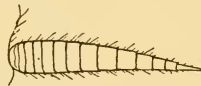


FIG. 15.—CERCI OF PERIPLANETA AMERICANA, FEMALE.

*Pelmatosilpha rotundata* Scudder is the only member of that genus found in our fauna.

Besides the common black roach of the house, *Blatta orientalis* Linnæus, we have one other member of this genus within our borders, *Blatta rhombifolia* of Stoll having been found in Arizona. The variegated thorax of the latter species, together with the lateral elytra of the males, will serve to separate it at a glance from the well-known house species. The genus *Neostylopyga* Shelford is a synonym of *Blatta* Linnæus, the species upon which it is based belonging to *Blatta* as shown by me.<sup>1</sup>

Of *Ischnoptera* we have several species. This genus has been recently revised by Rehn and Hebard.

<sup>1</sup> Psyche, vol. 18, 1912, p. 89.



*Ceratinoptera* Brunner is represented by two species, *diaphana* Fabricius and *lutea* Saussure and Zehntner. *Diaphana* is distinguishable from *lutea* by having an undulating black stripe extending longitudinally across each half of the pronotum and extending back over the elytra.

*Phyllodromica* Fieber contains a single North American species, *P. abortiva* Caudell, described some years ago from Texas as *Anaplecta abortiva*.

*Blattella* Caudell contains three species recorded from North America north of Mexico. The type, *germanica* Linnæus, is easily distinguishable from the other species by the disk of the pronotum, which is marked by two longitudinal parallel black stripes. The other two species, *dilatata* Saussure and *adspersicollis* Stål, both occur in our Southern States only, so far as reported, while *germanica* is a household pest nearly everywhere. Lack of sufficient authentic material of *B. dilatata* renders it inadvisable at this time to give diagnostic characters for the separation of this species from *adspersicollis*. The females can be distinguished by the length of the wings, which are not or scarcely longer than the abdomen in *dilatata* and considerably exceeding it in *adspersicollis*.<sup>1</sup>



FIG. 16.—PRONOTAL DISK OF PSEUDOMOPS CINCTA, SHOWING COLORATION.

*Supella* Shelford, based on the single species *Blatta supellectilum* of Serville, has as the main differentiating character the armature of the anterior inferior margin of the fore femora, a very unsatisfactory character, as fully set forth by Saussure and Zehntner.<sup>2</sup>

*Pseudomops* contains two species found with us, *P. cincta* Burmeister and *P. intercepta* Burmeister. The latter is what has been recorded in our fauna as *oblongata*. Shelford separates these two United States species as follows.

*Key to species of genus Pseudomops.*

- a<sup>1</sup>. Ground color of pronotum fuscous, the lateral yellow margin not inwardly produced (fig. 16) ..... *cincta* Burmeister.  
 a<sup>2</sup>. Ground color of pronotum some shade of rufous, the lateral pale border produced inwardly ..... *intercepta* Burmeister.

*Phatalia lævigata* Palisot, the only nearctic representative of that genus, has as synonyms *Nauphota pallida* Brunner and *N. marginalis* Walker. Kirby catalogues *N. pallida* Brunner as distinct from *lævigata* Palisot, placing Palisot's species in the genus *Leucophæa* with

<sup>1</sup> Mr. Shelford has made this species the type of a new genus, which he calls *Neoblattella*. The only characters mentioned as different from *Blattella* are the ramose ulnar vein of the wing and the anterior portion of the wing being broader, especially apically. This last character is good for the separation of the respective type species of these two genera, but does not separate other species of *Blattella* from *adspersicollis*, some species indeed falling in this respect nearly intermediate between *germanica* and that species. Also, I find considerable variation in the branching of the ulnar vein, even in different specimens of the same species. The examination of a very few specimens shows a variation of from three to five branching in *adspersicollis* and from simple to two branching in *germanica*. I therefore consider *Neoblattella* a synonym of *Blattella*.

<sup>2</sup> Biol. Cent.-Amer., Orth., vol. 1, 1893, p. 30.

a query. But from a study of several specimens from West Indies and South and Central America and Teneriff together with the figure of Palisot and the description of Brunner I agree with the late Mr. Shelford in considering these synonymous. I follow Kirby in placing the *N. marginalis* of Walker in the synonymy under this species. The measurements of *marginalis* would seem to preclude its inclusion here, but Kirby should be able to judge this matter properly, having Walker's types for comparison.

The other genera of this subfamily are represented in our fauna by one or two species each, all from our Southern States. *Eurycotis fischiana* Saussure is worthy of a place in the list only as a visitant, if at all, being recorded only from a single nymph introduced and one questionably identified as that species.

Two genera belonging to the subfamily Plectopterinae are found in the United States, *Chorisoneura* Brunner and *Plectoptera* Saussure. The former is distinguished by having the elytra very little convex and with a distinct anal sulcus. Each of these genera are represented with us by two species. *Chorisoneura texensis* Saussure and Zehntner is smaller than *C. picea* Rehn, being less than 10 mm. in total length. *Plectoptera picta* Saussure and Zehntner is known in the United States by a single specimen in the United States National Museum labeled "Va." The large black discal spot of the pronotum of this species will readily separate it from *P. poeyi* Saussure.

We have several genera of the subfamily Panchlorinae separable as follows.

*Key to nearctic genera of the subfamily Panchlorinae.*

- a<sup>1</sup>. Basal segment of hind tarsi naked beneath.  
 b<sup>1</sup>. Posterior femora with an apical spine beneath on both margins. *Pycnoscelus* Scudder.  
 b<sup>2</sup>. Posterior femora with an apical spine beneath on one margin only or on neither margin.  
 c<sup>1</sup>. Wings and elytra surpassing the tip of the abdomen. . . . *Leucophæa* Brunner.  
 c<sup>2</sup>. Wings abortive, elytra about half as long as the pronotum, covering scarcely more than one half of the abdomen. . . . *Hormetica* Burmeister.
- a<sup>2</sup>. Basal segment of the hind tarsi hairy beneath.  
 b<sup>1</sup>. Small, the entire length less than 10 mm. . . . *Holocompsa* Burmeister.  
 b<sup>2</sup>. Larger, the entire length 10 mm. or more. . . . *Panchlora* Burmeister.

Each of the above genera are represented in our fauna by a single species except *Panchlora*, of which several species have been reported from the United States and Canada, most of them introductions, as indeed are many of our roaches. The species of *Panchlora* are in a state of chaos and the genus is in dire need of revision.

Our only species of *Holocompsa*, '*H. collaris* Burmeister, has arolia between the claws and is therefore placed in this subfamily.

The subfamily Corydinae contains three North American genera separable as follows.

## Key to genera of subfamily Corydinæ.

- a*<sup>1</sup>. Anterior tibiæ not or but little more than three times as long as the greatest width, apically conspicuously swollen; larger forms, the pronotum 3, or more mm. in length.
- b*<sup>1</sup>. Posterior tibiæ with six apical spurs and armed beneath with 4-6 spines and with short pile; abdomen naked beneath.....*Arenivaga* Rehn.
- b*<sup>2</sup>. Posterior tibiæ with seven apical spurs and armed beneath with but two spines on the apical fifth and with fine long hairs; abdomen hairy beneath.  
*Eremoblatta* Rehn.
- a*<sup>2</sup>. Anterior tibiæ five or six times longer than the greatest width, apically very little swollen; smaller forms, the pronotum no more than 2 mm. in length  
*Latindia* Stål.

*Arenivaga* and *Eremoblatta* were established as subgenera of *Homeogamia*, and the species pertaining to them, except a few varietal forms described since, are reviewed by Mr. J. A. G. Rehn.<sup>1</sup> The third genus, *Latindia*, is represented with us by the single species *L. schwarzi* Caudell.

Of the subfamilies Blaberinæ and Panesthinæ we have one genus each, *Blaberus* Serville and *Cryptocercus* Scudder, the former having long wings while the second has neither wings nor elytra. *Cryptocercus* contains the single species *C. punctulatus* Scudder, but there are two species of *Blaberus* which have been taken in our confines. These two species may be distinguished by *atropos* having the large discal spot of the pronotum reaching the posterior margin, while in *cubensis* it does not reach the posterior margin. *Atropos* seems eligible to a place in the list of nearctic Blattidæ, but *cubensis* is but a transient visitor, a single specimen being known from our borders, a single female from New York, very surely an accidental importation. The specimen recorded in 1910 by Mr. Rehn<sup>2</sup> as this species has proved to be an *atropos*.

## Family MANTIDÆ.

Representatives of three of the six subfamilies of the Mantidæ are found within the borders of the United States. As represented with us these may be separated by the following key.

## Key to subfamilies of nearctic Mantidæ.

- a*<sup>1</sup>. Head unarmed; middle and hind tibiæ rounded above.
- b*<sup>1</sup>. Pronotum at least twice and usually three or more times as long as broad and noticeably broadened at the point of insertion of the coxæ (figs. 17 and 23).  
MANTINÆ.
- b*<sup>2</sup>. Pronotum subquadrate, but little longer than broad and the sides parallel (fig 18).  
EREMIAFILINÆ.
- a*<sup>2</sup>. Head armed with a pair of long processes, as long as the head itself; middle and hind tibiæ carinate above.....VATINÆ.

<sup>1</sup> Proc. Acad. Nat. Sci. Phila., 1903, pp. 177-192.<sup>2</sup> Ent. News, vol. 21, p. 103.

By far the greater proportion of the nearctic Mantidæ belong to the first subfamily as defined above. The dozen genera comprising this subfamily in our fauna may be for the most part easily separated by the following key, which is based partially on purely superficial characters.

*Key to genera of subfamily Mantinæ.*

- a*<sup>1</sup>. Eyes rounded (obtusely conical in *Litaneutria*) (fig. 19), insects varying in size and, except the females of *Thesprotia* and *Bactromantis*, all with more or less well-developed wings.
- b*<sup>1</sup>. Inner margin of the upper surface of the extended anterior coxæ not conspicuously dilated apically (fig. 20).
- c*<sup>1</sup>. Pronotum not or but little longer than the anterior coxæ.
- Litaneutria* Saussure.
- c*<sup>2</sup>. Pronotum considerably longer than the anterior coxæ.
- d*<sup>1</sup>. Antennæ filiform.
- e*<sup>1</sup>. Broadest portion of the pronotum far in advance of the middle, the width again diminishing anterior of the broadest point (fig. 17).
- f*<sup>1</sup>. Larger, pronotum more than 10 mm. in length.
- g*<sup>1</sup>. Pronotum of the female scarcely longer than the elytra.
- h*<sup>1</sup>. Facial shields distinctly more than twice as broad as high in both sexes, in the male about three times as broad (fig. 24).
- Stagmomantis* Saussure.
- h*<sup>2</sup>. Facial shield of neither sex scarcely more than twice as broad as high (fig. 25).
- i*<sup>1</sup>. Inner surface of fore coxæ ornamented on the basal third with a large oval piceous spot ..... *Mantis* Linnæus.
- i*<sup>2</sup>. Inner surface of fore coxæ not ornamented as above.
- Paratenodera* Rehn.
- g*<sup>2</sup>. Pronotum of the female decidedly longer than the elytra.
- Phasmomantis* Saussure.
- f*<sup>2</sup>. Smaller, the pronotum no more than 10 mm. in length.
- Callimantis* Stål.
- e*<sup>2</sup>. Broadest portion of the pronotum beginning at about the middle and from there to the apex almost or quite parallel (fig. 23)... *Gonatista* Saussure.
- d*<sup>2</sup>. Antennæ distinctly swollen just beyond the base (fig. 22).
- Brunneria* Saussure.
- b*<sup>2</sup>. Inner margin of the upper surface of the extended anterior coxæ abruptly and considerably elevated apically (fig. 21).
- c*<sup>1</sup>. Anterior tibiæ longer than their apical claw.
- d*<sup>1</sup>. Fore and hind sections of the pronotum subequal in length.
- Oligonyx* Saussure.
- d*<sup>2</sup>. Hind section of the pronotum about twice as long as the fore section.
- Bactromantis* Scudder.
- c*<sup>2</sup>. Anterior tibiæ no longer than the apical claw..... *Thesprotia* Scudder.
- a*<sup>2</sup>. Eyes produced and acutely conical (fig. 26); insects of small size, seldom over an inch long, and entirely wingless..... *Yersinia* Saussure.

Several years ago<sup>1</sup> I gave a table of the species of the genus *Litaneutria*. That key was not very satisfactory but it was the best I could do then and I can do no better now. Since that time one new species has been described, the *L. skinneri* of Rehn, characterized by the abbreviated organs of flight of the males. It is possible that

<sup>1</sup> Proc. U. S. Nat. Mus., vol. 28, 1905, p. 463.

the males of this genus are dimorphic in wing length and that most or all the species will be found with short-winged males, though such conditions are uncommon in the Mantidæ. *Skinneri* was described from Arizona but has since been recorded from Texas, New Mexico, and California and also occurs in Colorado and Nebraska. It may prove to be the brachypterous form of an older species if the males of these insects do prove to be dimorphic in wing length.

Since Scudder's catalogue appeared there have been two species of the genus *Stagmomantis* described, *S. gracilipes* Rehn, from Arizona, and *S. californica* Rehn and Hebard from California. The former I do not know, the type, a single male, being in the Snow collection in Kansas. It seems closely allied to *limbata*. Of what I consider as *S. californica* I have one male from Oil Center, California, one pair

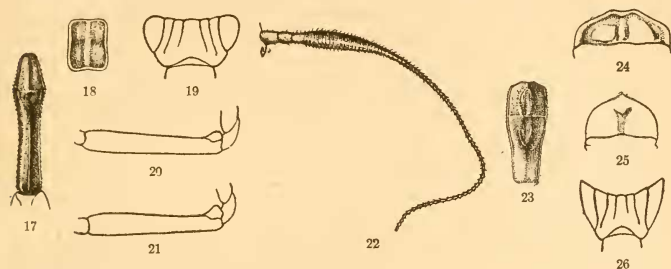


FIG. 17.—PRONOTUM OF STAGMOMANTIS, SHOWING SHAPE.

FIG. 18.—PRONOTUM OF MANTOIDA, SHOWING SHAPE.

FIG. 19.—HEAD OF LITANEUTRIA, SHOWING SHAPE OF EYES.

FIG. 20.—EXTENDED ANTERIOR COXA OF LITANEUTRIA, SHOWING THE ROUNDED SWELLING OF THE DISTAL END OF THE INNER DORSAL MARGIN.

FIG. 21.—EXTENDED ANTERIOR COXA OF OLIGONYX, SHOWING THE MORE PROMINENT AND ABRUPT SWELLING OF THE DISTAL END OF THE INNER DORSAL MARGIN.

FIG. 22.—ANTENNA OF BRUNNEA, SHOWING THE BASAL SWELLING.

FIG. 23.—PRONOTUM OF GONATISTA, SHOWING SHAPE.

FIG. 24.—FACIAL SHIELD OF STAGMOMANTIS, SHOWING WIDTH AS COMPARED WITH THE HEIGHT.

FIG. 25.—FACIAL SHIELD OF MANTIS, SHOWING WIDTH AS COMPARED WITH THE HEIGHT.

FIG. 26.—HEAD OF YERSINIA, SHOWING SHAPE OF THE EYES.

from Golden Roads, Arizona, one female from Rhyolite, Nevada, one male from Las Cruces, New Mexico, and one female from El Paso, Texas.

Probably all of the species of this genus come in both green and brown colored forms. The typical color of the common eastern species, *S. carolina*, is brown, the green form bearing the name *irrorata* of Linnæus.

The three species known to me and belonging to our fauna may be separated as follows.

*Key to species of genus Stagmomantis.*

a<sup>1</sup>. Abdomen dorsally uniform, or almost uniform in coloration.

b<sup>1</sup>. Costal area of the elytra of the male transparent, or nearly so; costal area of the elytra of the female tapering from near the base.....*carolina* Linnæus.

- b<sup>2</sup>. Costal area of the elytra of the male coriaceous and opaque; costal area of the elytra of the female with the margins subparallel to near the distal end.  
*limbata* Hahn.
- a<sup>2</sup>. Basal three or four segments of the abdomen conspicuously marked transversely above on the posterior fourth or more with black or dark brown.  
*californica* Rehn and Hebard.

*Phasmomantis sumichrasti* Saussure does not appear very well established as a nearctic form as it seems never to have been recorded from our region except one time, by Saussure and Zehntner from a specimen in the Museum at Geneva.

I consider *Oligonyx uhleri* Stål a variety of *O. scudderi* Saussure, the only essential difference seeming to be the hyaline wings and elytra of *scudderi* as compared with the infuscated ones of *uhleri*. A single male specimen of *uhleri* is in the collection of the National Museum.

A female specimen of *Thesprotia graminis* in the collection of the United States National Museum, is labeled as coming from New York. This must be an accidental occurrence.

The subfamily Eremiaphilinæ is represented by a single genus and species found in our region, the *Mantoida maya* of Saussure and Zehntner, having been recorded from Florida.

Two genera of the subfamily Vatinæ occur in our fauna. The posterior tibiæ of *Vates* Burmeister being furnished with foliations will serve to separate that genus from *Phyllovates* Kirby, where they are simple. *Phyllovates* is represented with us by the single species *chlorophææ* Blanchard, a rare species listed by Scudder as *Theoclytes chlorophææ* and recorded from the Gulf States and by accident from New York. *Vates* contains two species recorded from the United States, both from Arizona. These are *V. paraensis* Saussure and *V. townsendi* Rehn. These two species may be best distinguished by the costal area of the elytra of the female which is abruptly tapered near the apex in *townsendi* and gradually tapered from near the base in *paraensis*. Both are very rare species in our fauna.

#### Family PHASMIDÆ.

The Phasmidæ of nearctic America were revised by the writer a few years ago, but since that date several new genera and species have been described which necessitates new keys for the separation of certain genera and species. Five of the fifteen subfamilies of Phasmidæ are represented in our fauna. They may be easily separated by the following key.

##### *Key to subfamilies of nearctic Phasmidæ.*

- a<sup>1</sup>. Tarsi five jointed; not small earwig-like creatures with the cerci of the male forcep-like.
- b<sup>1</sup>. Mesothorax four or more times as long as the prothorax; hind and middle tibiæ carinate ventrally to the tip, without an apical areolate area.
- c<sup>1</sup>. Median segment not or barely longer than broad; apterous.

- d*<sup>1</sup>. Antennæ longer than the fore femora.....BACUNCULINÆ.  
*d*<sup>2</sup>. Antennæ shorter than the fore femora.....CLITUMNINÆ.  
*c*<sup>2</sup>. Median segment distinctly longer than the width; adults with short elytra  
 and wings.....PHIBALOSOMINÆ.  
*b*<sup>2</sup>. Mesothorax never more than three times as long as the prothorax, generally less;  
 hind and middle tibiæ furnished beneath apically with a sunken areolate  
 area.....ANISOMORPHINÆ.  
*a*<sup>2</sup>. Tarsi three jointed; small earwig-like creatures with the cerci of the male forcep-  
 like.....TITEMINÆ.

The first of these subfamilies, Bacunculinae, includes several genera comprising far more species than all the other four subfamilies taken together. The nearctic american genera falling into this subfamily are separable as follows.

*Key to genera of subfamily Bacunculinae.*

- a*<sup>1</sup>. Head subquadrate or cylindrical, usually distinctly longer than broad, attached obliquely or horizontally; small or moderate sized species with the hind femora not armed as in the alternate; cerci of the male not spatulate.  
*b*<sup>1</sup>. Posterior femora of both sexes armed beneath with a prominent subapical spine, often quite small in the female; middle femora of the male generally distinctly thicker than the hind ones.  
*c*<sup>1</sup>. Head unarmed.....*Diapheromera* Gray.  
*c*<sup>2</sup>. Head armed with a pair of small horns....*Rhabdoceratites* Rehn and Hebard.  
*b*<sup>2</sup>. Posterior femora of both sexes without a prominent subapical spine beneath; middle femora of male usually not or but little thicker than the hind ones.  
*c*<sup>1</sup>. Head unarmed above.  
*d*<sup>1</sup>. Cerci of male simple; head smooth, antennæ more than twice as long as the anterior femora.  
*e*<sup>1</sup>. Middle femora armed beneath with a distinct subapical spine.  
*Manomera* Rehn.  
*e*<sup>2</sup>. Middle femora without a distinct subapical spine beneath.  
*Heteronemia* Gray.  
*d*<sup>2</sup>. Cerci of male apically trifid; head carinate or longitudinally rugose between the eyes; antennæ usually less than twice as long as the anterior femora.  
*Pseudoseymyle* Caudell.  
*c*<sup>2</sup>. Head armed above with a pair of horns or leaf-like appendages.  
*Hoploibethra* Caudell.  
*a*<sup>2</sup>. Head ovate, short, scarcely longer than broad; attached subvertically; cerci of male broadly spatulate; very large species with the hind femora armed beneath for entire length with a median row of strong spine.....*Megaphasma* Caudell.

The genus, *Diapheromera*, contains several species which are more or less closely allied, and, especially in the female, often difficult to separate. The females divide into two groups, one with the cerci scarcely more than one-half as long as the eighth abdominal segment, and the other with the cerci decidedly more than one-half as long as that segment. The first group consists of *femorata* Say and *arizonensis* Caudell, the first with the operculum arcuate apically, while in the second that organ is arcuate truncate, with a distinct median projecting finger. The second group contains the rest of the species,

which in this sex are hard to separate diagnostically, and more material and study is necessary for the preparation of a key to separate them on this sex alone. The following key, based mostly on the males, will prove of help in the determination of these walking sticks.

*Key to males of genus Diapheromera.*

a<sup>1</sup>. Cerci incurved.

b<sup>1</sup>. Cerci cylindrical, with a basal tooth or tubercle.

c<sup>1</sup>. Cerci with an acute and slender basal tooth.

d<sup>1</sup>. Ninth segment of the abdomen scarcely longer than the greatest width.

*velii* Walsh.

d<sup>2</sup>. Ninth abdominal segment distinctly longer than the greatest width.

*persimilis* Caudell.

e<sup>2</sup>. Cerci with a blunt basal tooth or tubercle.

d<sup>1</sup>. Seventh and ninth segments of the abdomen subequal in length.

e<sup>1</sup>. Ninth segment of the abdomen distinctly longer than the greatest width; inner ventro-lateral carina of the hind femora with very minute serrations; cerci of the female as long as the eighth segment of the abdomen.

*persimilis* Caudell.

e<sup>2</sup>. Ninth segment of the abdomen scarcely or no longer than the greatest width; inner ventro-lateral carina of the posterior femora smooth; cerci of the female about one-half as long as the eighth segment of the abdomen.

*arizonensis* Caudell.

d<sup>2</sup>. Seventh segment of the abdomen distinctly longer than the ninth (cerci of female about one-half as long as the eighth segment of the abdomen.)

*femorata* Say.

b<sup>2</sup>. Cerci strongly compressed, without any basal tooth or tubercle. . . . .*carolina* Scudder.

a<sup>2</sup>. Cerci rigidly straight, or more or less curled in drying. . . . .*mesillana* Scudder.

*D. persimilis* shows some considerable variation in the basal tooth of the cerci of the male. This is sometimes sharp, like in *velii*, and sometimes apparently nearly as blunt as in *femorata*. But the comparative lengths of the last segments of the abdomen of the male will separate it from *velii* or *femorata*, and the long cerci of the female prohibits it from being confused with the latter species.

I have two male specimens which I take to be *D. mesillana*. They are nymphs, and come from Victoria, Texas, and I have an adult male from Columbus, Texas. Specimens from Brownsville, Texas, are in the Museum of the Brooklyn Institute of Arts and Sciences, and in the Scudder collection I find a male from Kansas which I determine as this species. In this specimen from Kansas the cerci are not concave on the inner side, and it is doubtful if any are in life, as the cerci of female specimens of most species are naturally round when fresh but flatten out in drying. The cerci of the male of *mesillana* being straight, like that of the female of most species, is very likely naturally round. More investigation with fresh material is necessary to make this certain. If the cerci of this species are actually concave on the inner side, the round shape of those of this Kansas specimen must be attributed to the specimen being originally preserved in spirits, which it very clearly was.



The following notes on the male type of this species are copied from my notebook as written a few months ago: "The male type has the cerci convex outwardly and deeply concave inwardly. The ninth segment of the abdomen is about two times as long as broad, parallel sided, and posteriorly broadly notched, the entire length about equaling that of the cerci; eighth segment two-thirds as long as the ninth, of the same width posteriorly and broadening a little anteriorly; seventh segment about the same length as the ninth and of the same width posteriorly as the anterior width of the eighth segment, the anterior part gently narrowing. Middle femora not much longer than the hind ones. Spine of the hind femora small, but distinct."

The following notes on the unique male type of *D. carolina* are from my note book: "Cerci strongly incurved and much flattened, being fully twice as thick vertically as horizontally, broadened slightly toward the apex; outwardly the cerci are convex and inwardly, especially in the apical portion, concave, nearly spoon-shaped; no basal cercal tooth visible. Ninth segment of the abdomen globose no longer than the posterior width. Seventh and eighth segments of abdomen equal in length, each slightly broader than long and neither quite as long as the ninth segment."

The Scudder collection contains a pair of walking sticks which I consider as probably belonging here in which the cerci of the male are more concave inwardly than those of the type. The cerci of this female are as long as the eighth segment of the abdomen and concave on the inside. The eighth segment of the abdomen is apparently a fourth shorter than the ninth. These were evidently preserved in spirits and are considerably shriveled. They are labeled "Palmer Assorting No. 1032." This, according to a note book shown me by Mr. Henshaw, means "Pacific R. R. Survey near 38° L. Sb. E. Beckwith, U. W. A."

The genus *Rhabdoceratites* of Rehn and Hebard is closely allied to *Diapheromera*, but the head being armed with a small pair of horns, or spurs, will serve to separate it from that genus. The only species recorded from our fauna is *R. covilleæ* Rehn and Hebard, described in 1909 from Texas. In 1906 I took nymphs at Ciudad Juarez, Mexico, on creosote bushes, but failed to rear adults. The Scudder collection contains a female from New Mexico. About the middle of September, 1912, Mr. C. K. Gray sent to the United States National Museum a female of this species which had freshly matured, the old skin being but partially cast. A month later three pairs of this fine insect were received from the same gentleman, all being taken from creosote bushes at El Paso, Texas. The eggs of this species, a number of which were found in the box with the living insects, are very like those of *Diapheromera*, but appear to be more fragile and are decidedly

less elongate, the length being noticeably less than that of the eggs of *Diapheromera*, while the width and thickness are about the same.

*Manomera* Rehn and Hebard, made for *Bacunculus* as used by Scudder and the writer, contains three species, separable by the following table, which is based on the males, as the female of *orthostylus* is unknown.

*Key to males of genus Manomera.*

- a*<sup>1</sup>. Middle femora not or scarcely thicker than the posterior ones.  
*b*<sup>1</sup>. Cerci curved inward.....*tenuescens* Scudder.  
*b*<sup>2</sup>. Cerci straight (fig. 27).....*orthostylus*, new species.  
*a*<sup>2</sup>. Middle femora distinctly thicker than the posterior ones.....*blatchleyi* Caudell.

The short and broader head of the female of *blatchleyi* will serve to separate it from *tenuescens*. The new species is described as follows:

MANOMERA ORTHOSTYLUS, new species.

*Male* (female unknown).—Similar to *tenuescens* Scudder, but readily distinguished from that species by the cerci of the male being straight instead of strongly incurved. The general color is brownish but is probably greenish in life. A lateral stripe runs across the head and thorax and onto the abdomen. Head, thorax, and abdomen smooth, the latter not inflated apically, all the segments being nearly or almost parallel sided; the ninth or apical segment is three times as long as broad, apically broadly and shallowly notched; eighth segment two-thirds as long as the ninth, twice as long as broad; seventh segment slightly longer than the eighth but not quite as long as the ninth. Operculum scarcely reaches the tip of the eighth segment. Cerci five or six times as long as the greatest width, tapering to a point and rounded, a little broader vertically than thick, usually flat



FIG. 27.—TIP OF ABDOMEN OF MANOMERA ORTHOSTYLUS, SHOWING STRAIGHT CERCI.

in dried specimens, the whole not quite as long as the last abdominal segment. The legs are slender, the middle femora armed beneath with a subapical spine, the hind femora without such spine, both femora of approximately the same thickness.

*Measurements*.—Total length, 61 mm.; pronotum, 2 mm.; mesonotum, 14 mm.; fore femora, 16 mm.; middle femora, 12.5 mm.;<sup>1</sup> hind femora, 16 mm.; cerci, 1.5 mm.

*Type*.—One male (Cat. No. 15275, U.S.N.M.), Orlando, Florida, April 14, 1907, Mr. Russell collector.

A paratypical male from the Scudder collection, from Dallas, Texas, has been examined. Except for being a little smaller and with longer cerci, as long as apical segment of abdomen, it is essentially like the type. The operculum also surpasses the eighth abdominal segment. It measures as follows: Total length, 45 mm.; pronotum, 2 mm.; meso-

<sup>1</sup> The left middle leg is dwarfed, the femora measuring but 10 mm. in length.

notum, 10 mm.; fore femora, 12 mm.; middle femora, 9 mm.; hind femora, 11.5 mm.; cerci, 2 mm.

Under the genus *Bacunculus* Brunner has recorded three walking sticks as occurring in our fauna, two of which are unknown to the writer. One is the *Bacteria (Bacunculus) striatus* of Burmeister and the others are ones described by Brunner as new, all treated as species of *Bacunculus* but rightly referable to the older generic name *Heteronemia* of Gray. *Striatus* Burmeister is recorded from Texas, another, *texanus*, is described from the same State, while the third, *lævissimus*, is described from St. Louis and "Lacus Ontario." These last two are very probably synonyms of other species, but until the types are seen it is not deemed advisable to so place them. The last, *lævissimus*, is probably a young female, *Diapheromera femorata*. The three species are separated as follows by Brunner, the table based on the female:

*Key to species described by Brunner.*

- a*<sup>1</sup>. Abdomen smooth.
- b*<sup>1</sup>. Second and third segments of the abdomen scarcely longer than broad; cerci short.....*lævissimus* Brunner.
- b*<sup>2</sup>. Second and third segments of the abdomen twice as long as broad; cerci long, lanceolate.....*texanus* Brunner.
- a*<sup>2</sup>. Abdomen multicarinate.....*striatus* Burmeister.

*Pseudoseymyle* Caudell has had one species added since the revision of the Phasmidæ of the United States in 1903 by the writer, *P. tenuis*, having been described from Texas in 1909 by Rehn and Hebard. This species, known from a single male specimen, is closely allied to *P. banksii* Caudell. No better table for the separation of the species of this genus than those in the above-mentioned revision have been made. The table there given for the females is fairly satisfactory, but the males are more difficult, and the character of comparative length given for the separation of this sex of *banksii* and *truncata* is not a good one.

The original description of *Hoplolibethra tuberculata* Caudell states that the hind tibiæ are provided beneath with an apical areolate area. This is an inexcusable mistake, there being no trace of such an area.

The later described *Libethra confusa* of Brunner from Mexico seems structurally allied to *Hoplolibethra tuberculata*, but the measurements given for it does not seem to agree very well.

*Parabacillus palmeri* Caudell described from Mexico has been taken within our borders, specimens in the U. S. National Museum from Oklahoma and Arizona being referred to that species. The diagnostic character of the long legs prove variable, and so this species is reduced to varietal rank.

In my revision of the Phasmidæ I included the first description of *Timema californica*, carefully crediting it to Scudder and quoting his

description exactly as sent to me by him and putting it in smaller type, thus properly establishing the species as his creation. Systematists who believe genera without valid species included are properly established will hold that the genus as well as the species should be credited to Scudder. Such, indeed, was my desire and intention, but, according to rules of nomenclature believed in and followed by me, a genus has to be credited to the person first using it in connection with a valid specific name.<sup>1</sup> Thus I am compelled to consider myself as the author of *Timema*.

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<sup>1</sup> See paragraph No. 27 of The Entomological Code.